

WHAT IS CLAIMED IS:

1. A paper-like material conveying apparatus comprising:  
a drive roller which is given with a driving force, rotated and  
5 driven; and

a driven roller arranged rotatably following the rotation of the  
drive rollers, the driven roller including a first layer formed with a  
solid elastic material that is in contact with the drive roller and a  
second layer formed with a foam elastic material that is formed at  
10 the inside from the first layer,

wherein paper-like materials conveyed into the nip between the  
drive roller and the driven roller are pinched, conveyed and carried  
out.

15 2. The paper-like material conveying apparatus according to  
claim 1, wherein thickness of the first layer is below 1/2 of that of  
the second layer, a coefficient of dynamic friction between the first  
layer and paper-like materials is more than 0.7 at less than a  
relative velocity difference 200 mm/s, a compression set of the  
20 second layer is below 5%, hardness of the second layer is below 40 at  
least at either Asker C hardness or JIS K 6253 E type hardness, and  
thickness of the second layer is more than 1.8 times of the most  
thick paper-like material.

25 3. The paper-like material conveying apparatus according to  
claim 2, wherein tear strength of the second layer is above 6 kN/m

at JIS K 6252 (ISO 34-1,34-2).

4. A paper-like material conveying direction switching apparatus comprising:

5 a drive roller which is given with a drive force, rotated and driven in both the forward and reverse directions; and

a driven roller arranged rotatably following the rotation of the drive rollers, the driven roller including a first layer formed with a solid elastic material that is in contact with the drive roller and a  
10 second layer formed with a foam elastic material that is formed at the inside from the first layer,

wherein paper-like materials in non-uniform thickness conveyed into the nip between the drive roller and the driven roller are pinched, conveyed and stopped and then, the drive roller is  
15 counter-rotated and the paper-like materials are carried out in the reverse direction.

5. The paper-like material conveying direction switching apparatus according to claim 4 further comprising:

20 a conveying apparatus to convey paper-like materials into the nip, receive paper-like materials carried out from the nip and convey in the counter-direction.

6. The paper-like material conveying direction switching  
25 apparatus according to claim 4, wherein thickness of the first layer is below 1/2 of that of the second layer, a coefficient of dynamic

friction between the first layer and paper-like materials is more than 0.7 at less than a relative velocity difference 200 mm/s, a compression set of the second layer is below 5%, hardness of the second layer is below 40 at least at either Asker C hardness or JIS K 6253 E type hardness, and thickness of the second layer is more than 1.8 times of the most thick paper-like material.

7. The paper-like material conveying direction switching apparatus according to claim 6, wherein tear strength of the second layer is above 6 kN/m at JIS K 6252 (ISO 34-1,34-2).

8. A paper-like material stamping apparatus comprising:  
a cylindrical stamp having a convex plate on the outer surface, which is given with a driving force and rotates;

an ink supply portion to supply ink to the outer surface of the cylindrical stamp; and

a platen roller arranged on the outer surface of the cylindrical stamp in the non-contact state via a prescribed gap, the platen roller including a first layer formed with a solid elastic material and a second layer formed with a foam elastic material that is formed at the inside from the first layer, and the platen roller being given with a driving force and rotated in the same direction as the cylindrical stamp,

wherein a mark is stamped on the surfaces of paper-like materials in non-uniform thickness carried into the gap by contacting and rotating the cylindrical stamp thereon.

9. The paper-like material stamping apparatus according to claim 8, wherein the gap is smaller than the thickness of the thinnest paper-like material.

5

10. The paper-like material stamping apparatus according to claim 8, wherein thickness of the first layer is below 1/2 of that of the second layer, a coefficient of dynamic friction between the first layer and paper-like materials is more than 0.7 at less than a relative velocity difference 200 mm/s, a compression set of the second layer is below 5%, hardness of the second layer is below 40 at least at either Asker C hardness or JIS K 6253 E type hardness, and thickness of the second layer is more than 1.8 times of the most thick paper-like material.

15

11. The paper-like material stamping apparatus according to claim 8, wherein tear strength of the second layer is more than 6 kN/m at JIS K 6252 (ISO 34-1, 34-2).

20

12. A paper-like material conveying apparatus comprising: plural drive rollers to contact the same surfaces of paper-like materials taken out on a conveying path and rotate in the conveying direction at the same peripheral velocity; and

25

plural driven rollers rigidly arranged in contact with plural drive rollers rotatably following the rotation of the drive rollers, respectively through the conveying path and allow to accept

paper-like materials conveyed into nips between the driven rollers and the opposed drive rollers by elastically deforming and rotate independently each other.

5        13. The paper-like material conveying apparatus according to claim 12 further comprising:

        a frame to which rotational shafts of the plural drive rollers and rotational shafts of the plural driven rollers are attached rigidly.

10

        14. The paper-like material conveying apparatus according to claim 13, wherein the plural driven rollers have rotational shafts fixed to the frame rotatably independently to the rotational shafts.

15        15. The paper-like material conveying apparatus according to claim 14, wherein the plural driven rollers are attached coaxially apart in the direction of the rotational shaft.

        16. The paper-like material conveying apparatus according to  
20 claim 13, wherein the plural drive rollers are attached coaxially apart in the direction of the rotational shaft.

        17. The paper-like material conveying apparatus according to  
claim 12, wherein the plural driven rollers are in the dual layers  
25 structure including a first layer formed with a solid elastic material and a second layer formed with a foam elastic material that is

formed at the inside from the first layer.

18. A paper-like material conveying direction switching apparatus comprising:

5 plural drive rollers which contact the same surfaces of paper-like materials taken out on a conveying path and rotate in the same direction at the same peripheral velocity; and

plural driven rollers which are arranged rigidly to contact the plural drive rollers through the conveying path, rotatably following  
10 the rotation of the drive rollers, allow to accept paper-like materials to the nips between the driven rollers and the opposed drive rollers by elastically deforming and rotate each other independently,

wherein paper-like materials conveyed into the plural nips are conveyed while pinched and stopped and then, the plural drive  
15 rollers are counter-rotated and the paper-like materials are carried out in the reverse direction.

19. The paper-like material conveying direction switching apparatus according to claim 18 further comprising:

20 a frame to which rotational shafts of the plural drive rollers and rotational shafts of the plural driven rollers are attached rigidly.

20. The paper-like material conveying direction switching  
25 apparatus according to claim 19, wherein the plural driven rollers have rotational shafts fixed to the frame rotatably independently to

the rotational shafts.

21. The paper-like material conveying direction switching  
apparatus according to claim 20, wherein the plural driven rollers  
5 are attached coaxially apart in the direction of the rotational shaft.

22. The paper-like material conveying direction switching  
apparatus according to claim 19, wherein the plural drive rollers are  
attached coaxially apart in the direction of the rotational shaft.

10

23. The paper-like material conveying direction switching  
apparatus according to claim 18, wherein the plural driven rollers  
are in the dual layers structure including a first layer formed with a  
solid elastic material and a second layer formed with a foam elastic  
15 material that is formed at the inside from the first layer.